

Practitioner's Docket No. 804-40075-US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Martikainen et al

Application No. 10/564,373

Filed: 1/12/2006

Examiner: Calandra, Anthony J

Art Unit: 1791

BATCH PROCESS FOR PREPARING PULP

**DECLARATION UNDER 37 CFR 1.132**

I, Panu Olavi Tikka, one of the named inventors of the above-identified application, hereby make the following Declaration.

1. My present address is Ankkurisaarentie 15 A, 02160 ESPOO, Finland. My phone number is +358-400-651-113.

2. I was born on September 24, 1955 in Helsinki, Finland. I passed my matriculation examination in 1974, and thereafter obtained a Masters Degree, on June 17, 1981, from the Department of Forest Products, Helsinki University of Technology, with the primary subject being Wood Chemistry and the secondary subjects being Pulping Technology and Organic Chemistry. I then obtained a Doctorate degree, on November 16, 2000, from the Laboratory of Pulping Technology, Helsinki University of Technology, with the primary subject of Pulping Technology, and the secondary subject of Wood Chemistry. My Doctoral thesis was entitled "Studies on industrial digesters and cooking performance - methods and applications.".

3. I have been with the Helsinki University of Technology in various capacities, as identified below.

- a. Teaching and Research Assistant, Laboratory of Wood Chemistry, 1979-1981
- b. Researcher and project manager, Laboratory of Pulping Technology, 1982-1984
- c. Professor, Laboratory of Pulping Technology, 1996-1997
- d. Professor, Laboratory of Pulping Technology, 2000-2006

4. I have also held various positions in the private sector, as identified below.

- a. R&D Manager, AFORA Oy, Pulp Mill Automation, 1985-1987
- b. Marketing Manager, AFORA Oy, Pulp Mill Automation, 1987-1988
- c. Process Consultant on Pulping Technology, SciTech-Service Oy Ltd, part time 1983-1988
- d. Senior Consultant on Pulping Technology, President, SciTech-Service Oy Ltd, 1988 -
- e. Director, Oy Lännen Laboratoriot - Western Laboratories Inc., 1994-2001
- f. President, CEO, Oy Lännen Tutkimus - Western Research Inc., 1998-2001

5. I have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment submitted to date.

6. I have also read the Office Action dated 12/17/2008 regarding the above-identified application, and have studied the reference identified as "Effect of Pretreatment with Green Liquor, AQ and Polysulfide on the Performance of an Extended Batch System" by WIZANI et al., hereinafter WIZANI.

7. WIZANI is holly inoperative as a reference teaching or suggesting how to apply fresh polysulfide liquor to an RDH cooking process. This is for the following reasons.

8. WIZANI is very poor and fails to disclose any understandable process. The experimental part is almost non-existent and does not even mention polysulfide. The document does not show volumetric balances, nor any temperatures in the process, liquors or tanks, although these are absolutely critical parameters for polysulfide cooking.

9. Further, the process described in terms of polysulfide is not possible using polysulfide liquor, and the process does not explain conditions to take advantage of polysulfide in cooking.

10. The document totally fails to explain how the polysulfide "household" is actually carried out. The only fact disclosed is on p. 422 , "In this study, 1,6% polysulfide was added to the WBL or HBL stages in addition to 21% AA charge of (3,3,15) RDH cooks." What does this teach? What kind of process could do so?

11. Firstly, it is not given what the 1.6% actually is (element? compound? equivalent?) and from what it is calculated. The office action presumes it is polysulfide on absolute dry wood. Let's take that as a fact: per 1 ton of dry wood, 1,6 % PS is 16 kg. Typical technical polysulfide white liquor contains between 5 - 10 g PS/l. At 5 gPS/l 16 kg PS equals 3200 l and at 10 gPS/l 16 kg PS equals to 1600 liters of PS white liquor to the cooking.

12. If the active alkali charge as in WIZANI is 21% AA per dry wood, and the typical industrial white liquor has 110 gAA/l, then the total

alkali charge for 1 t dry wood needs  $210 \text{ kg} / 0,11 \text{ kgAA/l} = 1910 \text{ liters}$  of white liquor.

13. Now it becomes evident that the "process" discussed in WIZANI is impossible. WIZANI says that 3% of active alkali is taken to the WBL stage. Per 1 t of dry wood this is  $30 \text{ kgAA} / 0,11 \text{ kgAA/l} = 272 \text{ liters}$  of white liquor.

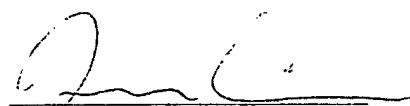
14. However, if we presume, as the examiner does, 1,6% PS and PS is in form of polysulfide white liquor, there should be between 1600 l to 3200 l of it to correspond to the amount of PS required. That is as much or more than the total white liquor amount giving the 21% AA charge. Thus, the process in WIZANI is impossible and the study has used some other research technique to add polysulfide in to the WBL stage having 3% AA charge. There is no known polysulfide process to produce "pure" polysulfide; it does not exist as such. I presume that the researchers have taken elemental sulfur and dissolved it into the WBL or something to make the PS charge 1,6%. This cannot be carried out in any technical process, as it would just add huge amounts of sulfur, and the factory would be flooded with sulfur.

15. The process in WIZANI fails to teach how polysulfide is introduced to the process. The given alkali charge in the front-end, 3% active alkali and the corresponding volume of white liquor, is by far not enough to carry out the given 1,6% polysulfide to the process. It remains unknown how 1,6% PS is charged, and it is not possible to do so with any technically feasible process.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 under the laws of the United States of America and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Executed on 14 April 2009.

By



Panu Olavi Tikka